

15. A method of identifying a presence of Down Syndrome in a fetus, comprising:

obtaining an amniotic fluid specimen by placing a syringe having a needle into a uterus and withdrawing the amniotic fluid specimen via the needle,

identifying a quantity for each metabolite that is present in the amniotic fluid specimen using a gas chromatograph/mass spectrometer,

compiling a patient profile, wherein the patient profile lists each metabolite and the quantity for each respective metabolite,

comparing the patient profile with a control profile representative of normal levels of each metabolite, wherein the control profile lists a quantity for each respective metabolite of the patient profile that is present in amniotic fluid of persons with Down Syndrome, by comparing the quantity of each metabolite of the patient profile with the quantity for that respective metabolite of the control profile, and

identifying the presence of Down Syndrome in the fetus when a quantity of a subset of metabolites of the patient profile has a different quantity than each respective metabolite of the control profile.

21. A method of identifying a presence of Down Syndrome in a fetus, comprising:

obtaining an amniotic fluid specimen by placing a needle into a uterus and withdrawing the amniotic fluid specimen via the needle,

identifying a quantity for each metabolite that is present in the amniotic fluid specimen by analyzing the amniotic fluid specimen using a gas chromatograph/mass spectrometer,

compiling a patient profile, wherein the patient profile lists each metabolite and the quantity for each respective metabolite present in the amniotic fluid specimen,

obtaining a control profile, wherein the control profile lists a quantity for each metabolite present in the amniotic fluid specimen for a population of patients without Down Syndrome.

identifying a plurality of abnormal quantities of metabolites of the patient profile by comparing the quantity of each metabolite of the patient profile with the quantity for that respective metabolite of the control profile, and

identifying the presence of Down Syndrome in the fetus when the plurality of abnormal quantities of metabolites of the patient profile corresponds to abnormal quantities of those metabolites in amniotic fluid of a patient known to have Down Syndrome.